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Applicant(s): Beuker et al. Group Art Unit: 2628

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For: APPARATUS FOR RE-ORDERING VIDEO DATA FOR DISPLAYS USING TWO TRANSPOSE STEPS AND STORAGE OF INTERMEDIATE PARTIALLY RE-ORDERED VIDEO DATA

Attention: Javid A. Amini
Commissioner for Patents
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PROPOSED CLAIM AMENDMENT

Sir:

Per our telephone conversation of March 17, 2009, attached is a proposed claim amendment. Please feel free to enter an Examiner's Amendment using this proposed claim amendment. If you have any questions or concerns, please contact me.

Date: March 19, 2009

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Amendment to the claims

Please cancel claims 10 and 11, and amend claims 1, 26 and 28 as shown in the following listing of claims. This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (currently amended) An apparatus for re-ordering video data for a display, comprising:

a) a first transpose means for receiving video data and performing a first transpose process on such video data to create partially re-ordered video data;

b) a means for storing the partially re-ordered video data; and

c) a second transpose means for reading the partially re-ordered video data and performing a second transpose process on such partially re-ordered video data to create fully re-ordered video data,

wherein the first and second transpose means are configured to perform the first and second transpose processes to convert the received video data to the fully re-ordered video data that is a transposed video data of the received video data, the fully re-ordered video data being compatible to a transposed scanning technique for driving the display, wherein the first transpose means includes means for receiving RGB video data and writing at least one frame of the RGB video data to the storing means, and means for separating the RGB video data into separate R, G, and B separation video data and writing at least one frame of the separation video data, at least one frame of the G separation video data, and at least one frame of the B separation video data to the storing means, and wherein the second transpose means includes:

a means for addressing the RGB video data stored in the storing means;

a means for reading the RGB video data stored in the storing means to created fully re-ordered RGB video data;

a means for communicating the fully re-ordered RGB video data to downstream modules of a display processing system;

a means for addressing the R, G, and B separation video data stored in the storing means;

a means for reading the R, G, and B separation video data stored in the storing means;

a means for re-ordering the R, G, and B separation video data into fully re-ordered R, G, and B color bar video data having consecutive downwardly scrolling R, G, and B scan lines; and

a means for communicating the fully re-ordered R, G, and B color bar video data to the downstream modules of the display processing system.

2. (original) The apparatus as set forth in claim 1 wherein the first and second transpose means include:

one or more programmable hardware blocks.

3. (original) The apparatus as set forth in claim 1 wherein:

the first transpose means includes a first programmable processor and the second transpose means includes a second programmable processor, such that the apparatus is programmable for any of a plurality of display formats.

4. (original) The apparatus as set forth in claim 3 wherein the first and second processors are fabricated on a common substrate (S).

5. (original) The apparatus as set forth in claim 4 wherein the storing means includes computer memory which is fabricated on the common substrate.

6. (previously presented) The apparatus as set forth in claim 4 wherein the storing means includes a separate IC that is electrically connected with the first and second programmable processors.

7. (original) The apparatus as set forth in claim 3 wherein the first and second processors are programmable to re-order video data for two or more types of displays selected from the group consisting of a transpose scan CRT display, an LCOS device, a PDP, a monochrome DMD, and a color DMD.

8. (previously presented) The apparatus as set forth in claim 1, the storing means including:

a means for storing at least two consecutive frames of the partially re-ordered video data.

9. (previously presented) The apparatus as set forth in claim 8 wherein the second transpose means includes a processor programmed to read the partially re-ordered video data associated with a first frame from the storing means while the first transpose means writes the partially re-ordered video data associated with a second frame to the storing means.

10. (canceled).

11. (canceled).

12. (canceled).

13. (previously presented) The apparatus as set forth in claim 1, the reading means including:

a means for identifying an operational configuration for the receiving means based on a selected display.

14. (previously presented) The apparatus as set forth in claim 10, the receiving means including:

a means for generating a plurality of sub-fields associated with a frame of the received video data, wherein each sub-field includes sub-field video data associated with the received video data; and a means for writing the sub-field video data for the plurality of sub-fields to the storing means.

15. (previously presented) The apparatus as set forth in claim 14, the generating means including:

a means for temporarily storing a predetermined amount of sub-field data that is generated serially, wherein the writing means transfers the predetermined amount of sub-field data from the temporary storing means to the storing means in parallel.

16. (previously presented) The apparatus as set forth in claim 14, the storing means including:

a means for storing the sub-field video data for the plurality of sub-fields.

17. (previously presented) The apparatus as set forth in claim 16, the reading means including:

a means for addressing the sub-field video data for the plurality of sub-fields in the storing means;

a means for reading the sub-field video data for the plurality of sub-fields in the storing means to create a fully re-ordered sub-field video data; and

a means for communicating the fully re-ordered sub-field video data to downstream modules of a display processing system.

18. (original) The apparatus as set forth in claim 14 wherein the sub-fields are RGB sub-fields and the sub-field data is RGB sub-field data.

19. (previously presented) The apparatus as set forth in claim 14, the generating means including:

a means for temporarily storing a predetermined amount of RGB sub-field data that is generated serially, wherein the writing means transfers the predetermined amount of RGB sub-field data from the temporary storing means to the storing means in parallel.

20. (previously presented) The apparatus as set forth in claim 18, the storing means including:

a means for storing the RGB sub-field video data for the plurality of RGB sub-fields.

21. (previously presented) The apparatus as set forth in claim 20, the reading means including:

a means for addressing the RGB sub-field video data for the plurality of RGB sub-fields in the storing means;

a means for reading the RGB sub-field video data for the plurality of RGB sub-fields in the storing means to create a fully re-ordered RGB sub-field video data; and

a means for communicating the fully re-ordered RGB sub-field video data to downstream modules of a display processing system.

22. (previously presented) The apparatus as set forth in claim 10, the receiving means including:

a means for generating a plurality of R separation sub-fields associated with a frame of the R separation video data, wherein each R separation sub-field includes R separation sub-field video data associated with the R separation video data;

a means for generating a plurality of G separation sub-fields associated with a frame of the G separation video data, wherein each G separation sub-field includes G separation sub-field video data associated with the G separation video data;

a means for generating a plurality of B separation sub-fields associated with a frame of the B separation video data, wherein each B separation sub-field includes B separation sub-field video data associated with the B separation video data; and

a means for writing the R separation sub-field video data for the plurality of R separation sub-fields, the G separation sub-field video data for the plurality of G separation sub-fields, and the B separation sub-field video data for the plurality of B separation sub-fields to the storing means.

23. (previously presented) The apparatus as set forth in claim 22, the storing means including:

a means for storing the R separation sub-field video data for the plurality of R separation sub-fields;

a means for storing the G separation sub-field video data for the plurality of G separation sub-fields; and

a means for storing the B separation sub-field video data for the plurality of B separation sub-fields.

24. (previously presented) The apparatus as set forth in claim 23, the reading means including:

a means for addressing the R separation sub-field video data for the plurality of R separation sub-fields in the storing means;

a means for reading the R separation sub-field video data for the plurality of R separation sub-fields in the storing means to create fully re-ordered R separation sub-field video data;

a means for communicating the fully re-ordered R separation sub-field video data to downstream modules of a display processing system;

a means for addressing the G separation sub-field video data for the plurality of G separation sub-fields in the storing means;

a means for reading the G separation sub-field video data for the plurality of G separation sub-fields in the storing means to create fully re-ordered G separation sub-field video data;

a means for communicating the fully re-ordered G separation sub-field video data to downstream modules of a display processing system;

a means for addressing the B separation sub-field video data for the plurality of B separation sub-fields in the storing means;

a means for reading the B separation sub-field video data for the plurality of B separation sub-fields in the storing means to create fully re-ordered B separation sub-field video data; and

a means for communicating the fully re-ordered B separation sub-field video data to downstream modules of a display processing system.

25. (previously presented) The apparatus as set forth in claim 10, the receiving means including:

a means for identifying an operational configuration for the receiving means based on a selected display.

26. (currently amended) An integrated circuit for re-ordering video data to a selected display format, the integrated circuit comprising:

a substrate;

a first programmable processor fabricated on the substrate and connected with video input and programming terminals, the first programmable processor being configured to perform a first transpose process on the video data to create partially transposed video data ;

a second programmable processor fabricated on the substrate and connected with video output and programming terminals, the second programmable processor being configured to perform a second transpose process on the partially transposed video data to create fully transposed video of the video data; and

a memory electrically connected with the first and second processors to have data written into the memory from the first processor and read out of the memory by the second processor,

wherein the fully transposed video data is compatible to a transposed scanning technique for driving the display, wherein first programmable processor includes means for receiving RGB video data and writing at least one frame of the RGB video data to the memory, and means for separating the RGB video data into separate R, G, and B separation video data and writing at least one frame of the separation video data, at least one frame of the G separation video data, and at least one frame of the B separation video data to the memory, and wherein the second programmable processor includes:

a means for addressing the RGB video data stored in the memory;

a means for reading the RGB video data stored in the memory to created fully re-ordered RGB video data;

a means for communicating the fully re-ordered RGB video data to downstream modules of a display processing system;

a means for addressing the R, G, and B separation video data stored in the memory;

a means for reading the R, G, and B separation video data stored in the memory;

a means for re-ordering the R, G, and B separation video data into fully re-ordered R, G, and B color bar video data having consecutive downwardly scrolling R, G, and B scan lines; and

a means for communicating the fully re-ordered R, G, and B color bar video data to the downstream modules of the display processing system.

27. (original) The integrated circuit as set forth in claim 26 wherein the memory is fabricated on the substrate.

28. (currently amended) A method of converting video data from a first format to a second format comprising:

programming a first processor with a first transform which transforms the first format video data to an intermediate format data for storage in a memory; and

programming a second processor with a second transform which transforms the intermediate format data from the memory into the second video format,

wherein the second format video data is a transposed video data of the first format video data, the second format video data being compatible to a transposed scanning technique for driving the display, and wherein the method further comprises:

receiving RGB video data;

writing at least one frame of the RGB video data to the memory;

separating the RGB video data into separate R, G, and B separation video data;

writing at least one frame of the separation video data, at least one frame of the G separation video data, and at least one frame of the B separation video data to the memory;

addressing the RGB video data stored in the memory;

reading the RGB video data stored in the memory to created fully re-ordered RGB video data;

communicating the fully re-ordered RGB video data to downstream modules of a display processing system;

addressing the R, G, and B separation video data stored in the memory;

reading the R, G, and B separation video data stored in the memory;

re-ordering the R, G, and B separation video data into fully re-ordered R, G, and B color bar video data having consecutive downwardly scrolling R, G, and B scan lines; and

communicating the fully re-ordered R, G, and B color bar video data to the downstream modules of the display processing system.

29. (previously presented) The method as set forth in claim 28 further including:

supplying the first format video data to the first processor;

transforming the supplied first format video data to the intermediate format data with the first processor;

writing the intermediate format data to the memory;

reading the intermediate format data from the memory with the second processor; and

transforming the intermediate format data to the second format video data.

30. (original) The method as set forth in claim 28 further including:

fabricating the first and second processors and the memory on a common substrate.